

WHAT IS CLAIMED IS:

1. A lithographic projection apparatus comprising:
  - a radiation system to transmit a beam of radiation emitted from a radiation source;
  - a support structure constructed to hold a patterning structure to be irradiated by the beam of radiation, said patterning structure adapted to pattern the beam;
  - a substrate holder constructed to hold a substrate;
  - a projection system constructed and arranged to project an irradiated portion of the patterning structure onto a target portion of the substrate;
  - a first screen positioned in a path of the beam of radiation between the radiation source and an optical element to be screened from positively charged particles, the first screen being substantially transparent to the projection beam of radiation, and a positive voltage being applied to the first screen to repel at least a portion of the positively charged particles away from the optical element; and
  - a second screen positioned in the path of the beam of radiation on at least one side of the first screen, a negative voltage being applied to the second screen to repel negative particles away from the first screen.
2. A lithographic projection apparatus according to claim 1, wherein the lithographic projection apparatus further comprises a surface which is either grounded or in electrical contact with the second screen to screen the radiation source from the first screen.
3. A lithographic projection apparatus according to claim 2, wherein the surface comprises a cylindrically or conically shaped casing, a longitudinal axis of the casing being substantially parallel to the path of the beam of radiation.
4. A lithographic projection apparatus according to claim 1, wherein the first screen and the second screen comprise a grid or mesh structure having a surface substantially perpendicular to the path of the beam of radiation.
5. A lithographic projection apparatus according to claim 1, wherein the second screen and the first screen comprise apertures which are mutually aligned along the path of the beam of radiation.

6. A lithographic projection apparatus according to claim 1, wherein the lithographic projection apparatus further comprises a third screen substantially at ground potential, positioned on a first side of the second screen opposite a second side facing the first screen.

7. A lithographic projection apparatus according to claim 6, wherein the third screen is of a similar structure as the first screen and the second screen.

8. A lithographic projection apparatus according to claim 1, wherein the positive voltage applied to the first screen is between about 0 V and about 20 kV.

9. A lithographic projection apparatus according to claim 8, wherein the positive voltage applied to the first screen is about 3 kV.

10. A lithographic projection apparatus according to claim 1, wherein the second screen is on a negative potential of between about -2 kV and about 0 V.

11. A lithographic projection apparatus according to claim 10, wherein the negative potential is about -400 V.

12. A lithographic projection apparatus according to claim 1, wherein the radiation source is adapted to be operated in a pulsed manner between a high state and a low state, and wherein the lithographic projection apparatus further comprises a synchronization device, the synchronization device being adapted to apply to the first screen a positive voltage during at least a part of the time the radiation source is in a low state.

13. A lithographic projection apparatus according to claim 12, wherein the positive voltage on the first screen is present for a period of a few microseconds.

14. A lithographic projection apparatus according to claim 12, wherein the second screen is connected to the synchronization device for varying the voltage applied to the second screen in synchronization with the positive voltage applied to the first screen.

15. A lithographic projection apparatus according to claim 12, wherein at least one wall is present in between the first screen and the second screen for capturing positively charged particles.

16. A lithographic projection apparatus according to claim 15, wherein the lithographic projection apparatus further comprises a photo ion capture structure for attracting positively charged particles towards the at least one wall.

17. A method of manufacturing an integrated structure by a lithographic process comprising:

transmitting a beam of radiation emitted from a radiation source;

patterning the beam of radiation;

projecting the beam of radiation onto a substrate;

screening the beam of radiation between the radiation source and at least one optical component with a first screen by applying a positive voltage to the first screen; and

screening the beam of radiation on at least one side of the first screen with a second screen by applying a negative voltage to the second screen.